

NON-PUBLIC?: N  
ACCESSION #: 9307290173  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Haddam Neck PAGE: 1 OF 06

DOCKET NUMBER: 05000213

TITLE: Temporary Loss of Power Due to Breaker Protection Scheme  
Miswiring  
EVENT DATE: 06/22/93 LER #: 93-009-00 REPORT DATE: 07/20/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 5 POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Gary H. Tylinski, Senior Engineer TELEPHONE: (203) 267-3633

COMPONENT FAILURE DESCRIPTION:  
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:  
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On June 22, 1993, at 0936 hours, with the plant in Mode 5 (Cold Shutdown), a temporary loss of offsite power was experienced. Test personnel were performing a test of the transfer trip scheme for the 115kV Station Service yard tie breaker 389T399. The test procedure included tripping of downstream breakers by the 389T399 Breaker Failure (BF) scheme. To accommodate the test, the bus 3 supply was transferred to Bus 2 through the 2T3 (4160v tie breaker) placing all station service power through the 3891 breaker. The 3991 breaker was withdrawn to the test position and closed to allow verification of the test trips without impacting other plant equipment. The procedure then specified to trip this breaker via the 389T399 BF lockout relay. During this step, the 3891 breaker tripped open instead of the 3991 breaker resulting in a temporary loss of offsite power. The cause of this event has been identified as wiring errors of the BF relay. The lockout contact and its associated isolation switch wiring for the 3991 breaker was found in the

3891 breaker trip circuit, in parallel with the contact arrangement for the 3891 breaker. This is being reported under 50.73 (a) (2) (iv) since there was an automatic actuation of an Engineered Safety Feature.

END OF ABSTRACT

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## BACKGROUND INFORMATION

Refer to accompanying sketch

The 115kV system normally supplies power to the plant 4160V system EIIS Code: EA! by two separate 115kV incoming lines and 115/4.16kV station service transformers T389 and T399 which are located in the 115kV switchyard EIIS Code: FK!. Also located in the switchyard is a cross-tie Oil Circuit Breaker (OCB), 389T399, which cross-connects the upstream side of the two station service transformers. These transformers supply power to the onsite 4160V system through two separate 4160V buses, 2 and 3, via low side output breakers 3891 and 3991 to ensure the availability of station service power. The two emergency safeguard buses EIIS Code: EB! 8 and 9 are normally powered directly from buses 2 and 3 respectively via breakers at each bus. During a loss of offsite power as sensed at the emergency bus level, the two emergency safeguards buses individually separate from their normal supply and are automatically repowered by their respective emergency diesel generator EIIS Code: EK!. The normal plant configuration is with the 115kV tie breaker, 389T399, closed as well as the station service transformer low side output breakers 3891 and 3991. Normally open circuit breaker 2T3 can cross connect buses 2 and 3 under abnormal or emergency conditions as necessary such that either or both 115kV lines powers either transformer and both 4160v buses. Buses 1A and 1B only power Reactor Coolant Pumps (RCPs) from offsite power during startup and are later shifted to Unit Station Service Transformer 309.

There are a number of standard protective relaying schemes utilized on the 115kV system equipment. The one which is applicable to this event is the Breaker Failure (BF) scheme. This scheme is initiated if the 389T399 breaker is called upon to isolate either the 1206 or 1772 line for a line or transformer fault and does not open. The 389T399 BF relay (86BF-A) will then trip the 3891 and 3991 breakers, transfer trip the upstream end (Haddam) of the 1206 line and transfer trip the upstream end (Middletown) of the 1772 line. The 389T399 breaker is 115kV line equipment operated under the direction of the Connecticut Valley Power Exchange (CONVEX) and is maintained by the an offsite Transmission and Distribution Organization.

The trip test procedure being performed at the time of the event had been recently modified to include the addition of actual trips of the 3991 and 3891 breakers (one at a time) by way of the 389T399 BF scheme. Testing down to this level had not been performed in the past.

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## EVENT DESCRIPTION

On June 22, 1993, at 0936 hours, with the plant in Mode 5 (Cold Shutdown), a temporary loss of offsite power was experienced. Test personnel were performing a test of the Breaker Failure (BF) transfer trip scheme for the 115kV Station Service yard breaker 389T399 (PMP 9.8-117, "1206 Connecticut Yankee-Haddam Line Trip Test"). inputs to the lockout relay (86BF-A), which performs the transfer tripping, had been previously tested. Each trip into the BF relay was performed with all of its downstream trips blocked (via flexi-test isolation switches). The next phase was to prove out each downstream trip from the BF lockout relay by individually arming the trip to the downstream breaker while the breaker is closed but in its test position. In this position, a breaker can be operated or cycled without any impact on other plant equipment or systems since it is not connected to the bus or load.

To accommodate the test of the 3991 breaker, the bus 3 supply had been transferred to Bus 2 through the 2T3 tie breaker placing all station service supply through the 3891 breaker. When the BF lockout relay was actuated, the 3891 breaker tripped open rather than the 3991 breaker. Since this breaker was carrying all plant load, a temporary loss of offsite power was experienced. The Emergency Diesel Generators started and re-energized their respective buses. Core Cooling via the Residual Heat Removal system was re-established within 2 minutes. Offsite power was restored in about 12 minutes. Spent fuel pool cooling was returned shortly after with no increase in fuel pool temperature. Station power was normalized within 35 minutes of the initiating event.

## CAUSE OF THE EVENT

The cause of this event has been identified as wiring errors on the 389T399 BF lockout relay and associated flexi-test isolation switches. The wiring for the 3891 and 3991 breaker trip circuits was physically verified and the following discrepancy was noted:

The 389T399 BF lockout contact and its associated flexi-test isolation switch for the 3991 breaker were found in the 3891 breaker trip circuit, in parallel with the contact arrangement for the 3891 breaker. With this

configuration, actuating either the 3891 or the 3991 breaker trips through the 389T399 breaker failure scheme would result in the trip of only the 3891 breaker. Additionally, in the event of an actual 389T399 breaker failure operation, the 3991 breaker would remain closed.

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## SAFETY ASSESSMENT

This event is being reported under 10CFR50.73 (a) (2) (iv) since there was an automatic actuation of an Engineered Safety Feature.

To assess the safety significance of this event the following limiting case scenario was considered: One of two diesels being run in parallel with offsite power for its monthly surveillance when a 115kV line or transformer fault occurs requiring the 389T399 breaker to trip, and it fails to trip.

The design of the Haddam Neck offsite power supply arrangement consists of two lines connected to one 115kV circuit breaker. This circuit breaker (389T399) is equipped with two trip coils, fed from two separate batteries and protective relay systems. Upon a Loss of Normal Power (LNP), the safety related electrical system is separated from these power supplies by actuation of under-voltage relays. The diesel generators are then automatically started and/or loaded.

In the case of a loss of normal power while a diesel generator is operating in parallel with the system, voltage will rapidly decay due to the high impedance of the diesel generator and the normal running loads. It is estimated that the voltage will decay to less than 50 percent in a fashion similar to the worst case loading of safety loads. The undervoltage relays will trip the safety-related bus free from the offsite supply within two seconds, and the running diesel generator will be available for emergency loading. The other diesel generator will automatically start and be available for loading within 10 seconds. it is important to note that only one diesel generator is tested at a time, therefore only one train might be subjected to the voltage dip.

The Haddam Neck diesel generators have a high impedance and are designed for large dead load pickup. Consequently, the voltage drop across the diesel generator is substantial when starting large induction machines. In this situation, over-current protection will not actuate to separate the diesel generator from the system.

The safety significance of the miswired fault protection circuitry is judged to be low, because the miswiring could not cause a failure of any

safety related component. The emergency generators would still be available in the event of an incoming line or transformer fault combined with a failure of the 3889T399 breaker.

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#### CORRECTIVE ACTION

The two breaker trip circuits will be rewired to correct the wiring error, followed by appropriate retests to verify the 389T399 breaker failure scheme. This is anticipated to be performed during the next refueling outage.

#### ADDITIONAL INFORMATION

NONE

#### PREVIOUS SIMILAR EVENTS

NONE

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Figure omitted.

ATTACHMENT 1 TO 9307290173 PAGE 1 OF 1

CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT

362 INJUN HOLLOW ROAD o EAST HAMPTON, CT 06424-3099

July 20, 1993

Re: 10CFR50.73(a) (2) (iv)

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D. C. 20555

Reference: Facility Operating License No. DPR-61  
Docket No. 50-213  
Reportable Occurrence LER 50-213/93-009-00

Gentlemen:

This letter forwards the Licensee Event Report 93-009-00, required to be

submitted, pursuant to the requirements of the Haddam Neck Plant's  
Technical Specifications.

Very truly yours,

John P. Stetz  
Vice President

JPS/mlg

Attachment: LER 50-213/93-009-00

cc: Mr. Thomas T. Martin  
Regional Administrator, Region I  
475 Allendale Road  
King of Prussia, PA 19406

Mr. William J. Raymond  
Sr. Resident Inspector  
Haddam Neck

\*\*\* END OF DOCUMENT \*\*\*

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